

U.S. Patent Application Serial No. 09/814,183
Amendment dated December 4, 2003
Reply to OA of April 2, 2003

REMARKS

Claims 1-5 are pending in this application, of which claims 1-3 have been amended. No new claims have been added.

The Examiner has objected to the Abstract and the Specification because of various informalities. The Abstract and Specification have been amended to correct the noted informalities. No new matter has been added.

Before turning to the cited references, a brief review of the present invention is in order. The present invention provides a useful, concrete, and tangible result by allowing a caterpillar to be durable for a long period of time. The present invention is intended to reduce an occurrence of brittle fracturing. When the principles of the present invention are applied, brittle fracture can be prevented. In the present invention, a ring 17 is positioned to contact a surface of a groove 18 on a pin 2 (see FIG. 1). The hardness of the pin 2 at the surface of groove 18, where ring 17 contacts groove 18, is lower than the hardness of the pin 2 where a link 1 contacts pin 2 (p. 12, lines 3-5). Ring 17 exerts a pressing force to pin 2, and the present invention effectively prevents a brittle fracture because groove 18 has a lowered hardness (p. 14, lines 19-25).

Claim 1, as amended, sets forth a "ring for limiting relative motion of the pin toward an off-opening side being fitted in the annular space and contacting a surface of the groove, with a hardness of the pin at the contacted surface of the groove being lower than that of the pin at a portion with which the link is connected."

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Claims 4-5 set forth a “ring for limiting relative motion of the pin toward an off-opening side is fitted, further a hardness of the pin at a bottom surface of the groove is lowered than that of the pin at a portion with which the link is connected”.

Claims 1-5 stand rejected under 35 USC § 103(a) as being unpatentable over Japanese Pub. No. 2001-010552 (**JP010552**) in view of US Pat. 5,076,149 (**Everts**).

Applicants respectfully traverse this rejection.

JP010552 describes a fixing structure for a link and pin of a caterpillar band, utilizing an elastic ring. Regarding this reference, the Examiner states that “There is no clear disclosure of differential hardening of the pin with the hardness of the pin at a bottom surface of the groove defined by material softer than a portion of the pin with which the link is connected.”

Everts describes an advantage of making a material deformable if one wants to perform a staking operation upon that material. **Everts** discloses a wrist pin formed from an elongated body having a pair of deformable sections formed adjacent to each end and a relatively hard middle section (Abstract). The deformable ends 52 and 54 are staked to retain wrist pin 18 within bores 26 and 28 in piston 14 (col. 4, lines 12-14; FIGS. 2, 4). The ends 52, 54 are deformable in order to allow them to be staked (FIG. 4; col. 4, lines 12-31).

JP010552 in view of **Everts** does not teach a groove surface having a low hardness, when no staking is going to be performed.



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JP010552 in view of **Everts** does not teach a groove surface having a low hardness, when a ring is to be fitted in the groove.

It would not be obvious to modify **JP010552** in the manner suggested by the Examiner, because **Everts** is directed to deformable materials which may be useful during staking.

Because of the differences between claim 1 and the cited references, it would not be obvious to modify those references to arrive at the claimed invention set forth in claim 1, as amended.

Also, because of the differences between claims 4-5 and the cited references, it would not be obvious to modify those references to arrive at the claimed invention set forth in claims 4 and 5.

In view of the foregoing, the cited references do not teach or suggest the desirability of making the combination of references and the extensive modifications needed to arrive at the claimed invention, as set forth in claims 1, 4, and 5. Also, the Examiner does not persuasively demonstrate the requisite suggestion or motivation in the references themselves, or in the knowledge generally available to a person of ordinary skill in the pertinent art, to combine the references and make the extensive modifications needed to arrive at the claimed invention.

The Examiner has not yet resolved the level of ordinary skill in the pertinent art. The Examiner has not yet provided evidence of findings regarding the level of ordinary skill in the art.

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Applicants respectfully traverse the rejection of claim 1, and all claims depending therefrom, because the cited art does not disclose or teach, alone or in combination, the features therein of "a hardness of the pin at the contacted surface of the groove being lower than that of the pin at a portion with which the link is connected", in combination with the other claim features.

Applicants respectfully traverse the rejection of claims 4 and 5, because the cited art does not disclose or teach, alone or in combination, the features therein of "a hardness of the pin at a bottom surface of the groove is lowered than that of the pin at a portion with which the link is connected", in combination with the other claim features.

Therefore, in view of the foregoing amendments and remarks, the rejections of claims 1, 4, and 5, and all claims depending therefrom, should be withdrawn.

Accordingly, all pending claims, as amended, are in condition for allowance, which action, at an early date, is requested.

If the Examiner feels that this application is not currently in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

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In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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PATENT TRADEMARK OFFICE

Enclosures : Substitute Abstract of the Disclosure



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SUBSTITUTE ABSTRACT OF THE DISCLOSURE

A link of a caterpillar which is allowed to maintain stabilized durability for a long period. The fixing structure has a link, and a pin inserted into a pin inserting bore formed in the link. A peripherally extending concave groove formed on the end portion of the pin and an opening periphery conjugate to form an annular space. In order to limit relative escaping motion of the pin in the off-opening side (toward receding direction), an escape limiting ring is fitted into the annular space. The hardness of the bottom surface of the peripherally extending concave groove is lower than the surface hardness of a link engaging portion of the pin.

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